Cathodoluminescence textures of hydrothermal vein quartz from the Mokrsko gold deposit, Czech Republic

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The thesis is focused on describing hydrothermal mineralization events, which created the largest gold accumulation in the Bohemian Massif - the Mokrsko gold deposit. Mokrsko is situated in Central Bohemia, about 50 km south from the city of Prague. The deposit can be described as a near-surface, low-grade (2 ppm of Au) gold deposit, hosted by a contact zone of a Variscan granitoid pluton (the Sazava granitoids) and a Neoproterozoic volcano-sedimentary complex (the Jilove Belt). Despite its being an undeveloped deposit (mining project), an extensive exploration activities (35 km of drillholes, 8 km of underground galleries) were undertaken here between the years 1980-1990. Extent of the exploration and the accessibility to its results provides ideal conditions for further research. Total gold potential was calculated on 100 tons of gold, which ranks the Mokrsko deposit among the most important gold deposits in Europe (Moravek *et al.* 1989).

SEM-CL, LA-ICP-MS, EMPA analysis of ore-bearing quartz are widely used methods in studies of mineral deposits (*e.g.* Rusk 2012). Combination of cathodoluminescent response and trace elements analysis helps us to describe different quartz generations (stages), their genesis, relationships and associated mineralizing events. Only few new studies (Zacharias *et al.* 2014; Boiron *et al.* 2001), using a combination of modern analytical methods and a present knowledge about characterization of gold deposits, were carried out here since the end of the exploration works. It is important to note that the combined analyses of CL and trace elements incorporation in quartz were not done at the Mokrsko gold deposit, as yet.

The first analyses indicate that the Au-bearing hydrothermal veins contain several quartz stages. SEM-CL clearly shows the different quartz stages in hydrothermal veins. These textures were observed in both older thicker quartz veins (Fig. 1.) and younger sheeted veins/veinlet system. We can distinguish Q1 - very dark grey to none CL (dark blue in coloured CL), which is sometimes overgrown by or alternate with bright Q2 (bright yellow in coloured CL). The last and the youngest quartz generation is grey Q3 cobweb, which cuts earlier Q1 and Q2.

As a preliminary result, it is possible to say, that heterogeneous features (representation of different quartz stages) in hydrothermal vein quartz increases toward the west (direct to the Sazava granitoids). Further work at this thesis will include geochemical analysis of trace elements incorporation in vein quartz (LA-ICP-MS and EMPA analysis), distinguish different quartz stages by their geochemical composition, relationships with mineralizing events and discuss these results with published and described genetic model/type of the Mokrsko gold deposit.

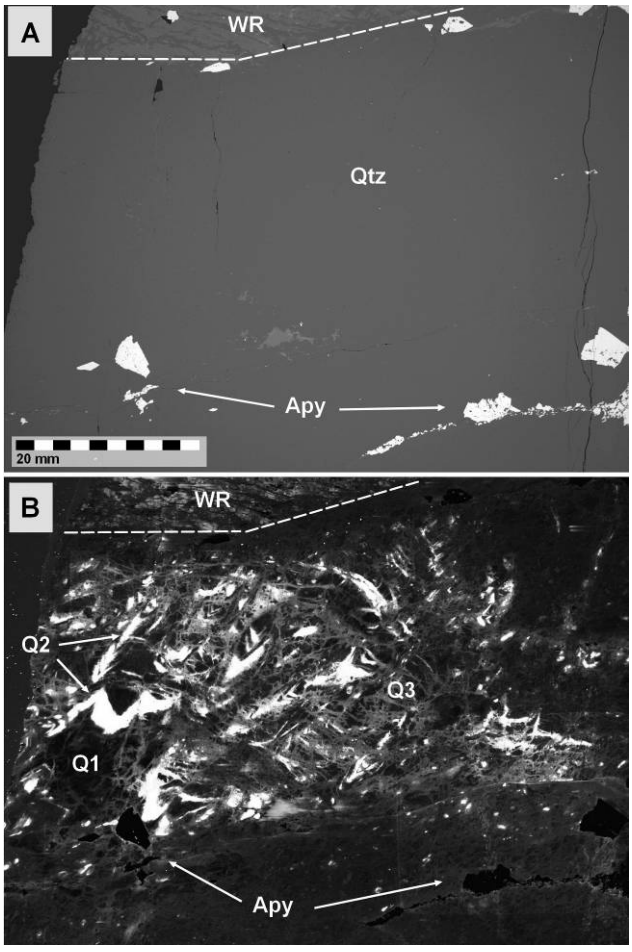

Fig. 1.: BSE (A) and CL (B) image of thicker Au-bearing quartz vein from the westernmost part of the Mokrsko-West deposit (WR - wall rock, Qtz - quartz, Apy - arsenopyrite, Q1-3 - different quartz stages).

Boiron, M. C., Barakat, A., Cathelineau, M., Banks, A. D., Durisova, J., Moravek, P. (2001): Chem Geol, 173: 207–225.

Moravek, P., Janatka, J., Pertoldova, J., Straka, E., Durisova, J., Pudilova, M. (1989): Econ Geol Monograph, 6: 252-259.

Rusk, B. (2012): *In:* Götze, J., Möckel, R. (*eds*.) Berlin - New York: Springer, ISBN 978-3-642-22161-3: pp. 360.

Zacharias, J., Moravek, P., Gadas, P., Pertoldova, J. (2014): Ore Geol Rev, 58: 238-263.